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DISCLOSURE

The authors have no conflict of interest regarding this research.

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The Palmaris Longus Tendon Weave: A Novel Method of Reconstructing the Transverse Carpal Ligament

A good thing is right, when it tends to preserve the integrity, stability and beauty of the biologic community. It is wrong when it tends otherwise.

—Aldo Leopold, *A Sand Country Almanac*, 1944[1]

Sir:

The ultimate goals of upper extremity reconstruction are to provide (1) adequate soft-tissue protection of vital structures and (2) optimal functional and aesthetic outcomes. Soft-tissue reconstruction of the upper extremity, when there is exposed bone or tendon, particularly in the hand and fingers, requires thin, pliable tissue. When there is significant disruption of the transverse carpal ligament, reconstruction should be considered to help stabilize the transverse carpal arch, prevent bowstringing of the flexor tendons, attempt to increase postoperative grip strength, and protect the median nerve.[2,3] We present the case of an 18-year-old, right-handed, male, heavy manual worker with a high-flow arteriovenous malformation affecting the right little finger and hypothenar eminence, resulting in dorsal ulceration, bleeding, and pain. Our reconstruction of choice following complete excision consisted of an innervated free lateral arm flap in combination with a palmaris longus tendon weave to reconstruct the transverse carpal ligament. The long-term cosmetic and functional outcome was excellent, and the patient returned to heavy manual work within 4 months postoperatively.

Resection of the vascular malformation required ray amputation of the fifth metacarpal, ulnar palmar skin, and ulnar half of the transverse carpal ligament (Fig. 1). The palmaris longus tendon insertion into the transverse carpal ligament was preserved, and tenotomy at the musculotendinous junctions was performed. The tendon was woven through the remaining transverse carpal ligament in a zigzag manner and secured using 4-0 polydioxanone suture (Fig. 2). An innervated free lateral arm flap completed the soft-tissue reconstruction. There were no postoperative complications, and digital mobilization was commenced on day 10. Review at 4 months revealed a soft, nonbulky flap with evidence of early sensory reinnervation and normal tendon excursion. The patient was delighted and had returned to heavy manual work.

Lateral arm flaps were first described in 1982, and their popularity for covering midsize defects of the upper extremity is increasing because of their matching recipient skin color, texture, and thickness, although

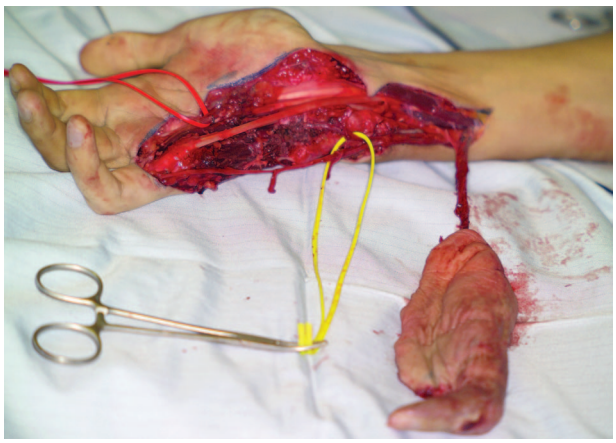

Fig. 1. Hand after resection of the vascular malformation, including a ray amputation of the fifth metacarpal, ulnar palmar skin, and ulnar half of the transverse carpal ligament.

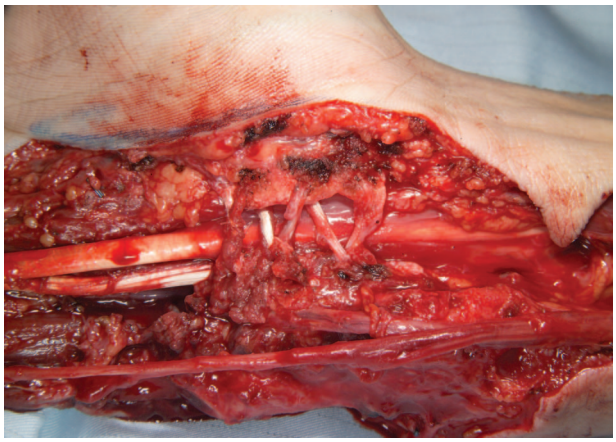

Fig. 2. The palmaris longus tendon is woven through the remaining transverse carpal ligament in a zigzag manner and secured using 4-0 polydioxanone suture.

they may require a thinning procedure at a later date. Although as hand surgeons we often operate on the transverse carpal ligament, our knowledge of the morphologic properties of the ligament is scarce. Research units from throughout the world are at present studying these properties in living subjects and cadavers, using magnetic resonance imaging and three-dimensional computer reconstruction. Several authors advocate reconstruction of the transverse carpal ligament with a variety of techniques following carpal tunnel release to avoid a decrease in postoperative grip strength, particularly in young patients.[2–5] A variety of reasons have been postulated to explain this postoperative weakness, including widening of the carpal arch and volar migration of the median nerve and flexor tendons, suggesting an element of bowstringing. To our knowledge, the use of a palmaris longus tendon weave to reconstruct the transverse carpal ligament has not been described in the literature. When it is necessary to reconstruct the transverse carpal ligament following significant disruption, we believe this offers a possible solution. The previously described techniques for reconstruction such as Z lengthening and the use of local transposition flaps would not have been possible in this case. We believe that with limited indications, this could be a useful technique for use by the hand surgeon.

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Intraperitoneal Bladder Rupture after Abdominal Liposuction

Sir:

A 42-year-old woman underwent an outpatient liposuction procedure at a community hospital. Using a flat suction cannula directed through bilateral stab incisions just above the hips, the surgeon removed over 5100 cc of fat from the abdomen, hips, and waist. The patient was discharged to home from the recovery room in stable condition.

While at home, the patient noted progressive voiding difficulty. On postoperative day 3, she presented to her local emergency department in mild distress with urinary retention, diffuse abdominal discomfort, distention, nausea, and vomiting. She was tachycardic without hypotension or fever and demonstrated acute peritoneal signs. Her medical history included a remote cesarean section and an abdominal hysterectomy for benign disease. She denied any prior voiding difficulties.

In the emergency department, a urinary catheter was easily placed and drained a low volume of bloody urine. Laboratory tests revealed a serum creatinine level of 6.0 mg/dl and a white blood cell count of 17,000 cells per microliter. An abdominal computed tomographic scan demonstrated an intraperitoneal position of the urinary catheter, gross ascites, and free air (Fig. 1). Because of the limited urologic resources of the referring hospital, the patient was transferred to our facility for definitive care.

Broad-spectrum antibiotics were initiated and the patient was brought to the operating room for an exploratory laparotomy through a low midline incision. After draining a large volume of cloudy ascitic fluid, the urinary catheter balloon was visualized exiting the bladder through a single 3-cm perforation in the posterior aspect of the dome. No other injuries were identified. There was notable chronic scarring of the prevesical space. Debridement and two-layer cystorrhaphy were performed, leaving a 20-French catheter for gravity drainage through the urethra.

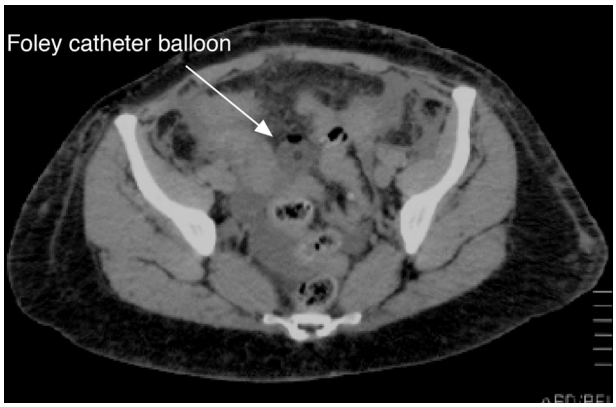

Fig. 1. Computed tomographic scan of the abdomen/pelvis showing an intraperitoneal urinary catheter balloon with moderate ascites, consistent with an intraperitoneal bladder injury.